

Collapsible Space Telescope (CST) for Nanosatellite Imaging and Observation

Completed Technology Project (2011 - 2012)



Project Introduction

This project furthers the development of innovative deployable aperture technologies meant for integration within 6U nanosatellites. Prior work developed the concept for a Collapsible Space Telescope. This work included a design of a deployment structure for a 152.4mm aperture f/8 RC telescope and the construction of a full-scale deployable truss tube prototype. This project will refine the telescope design to include computational ray tracing.

The ability to integrate a 15-20 cm telescope in a 6U nanosatellite demonstrates the applicability of nanosatellites for space science, operational, and exploration applications heretofore requiring larger platforms, showcase low-cost integrated optical technologies, develop a new cadre of space technologists, and demonstrate collaborative teaming with other government agencies, underserved communities, and industry. The ability to integrate a deployable Cassegrain telescope into a nanosatellite platform matches desires outlined within the Remote Sensing Instruments/Sensors Technical Area Roadmap and represents game changing technologies in small satellite subsystems to include the potential for swarm missions with distributed apertures. Additional Benefits include advancement of telescope, optics and nanosatellite capability, STEM/outreach, and commercial business development. Basic configuration for the deployable telescope has been established along with a concept design for the deployable telescope in previous studies. This study aims to further that effort on a path to enable integration within a 6U nanosatellite spacecraft by elevating the instrument's TRL from 2 to 4.

Anticipated Benefits

Any missions that will need a section for small spacecraft technologies, and also any missions that include telescopes as their main payload.



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Table of Contents

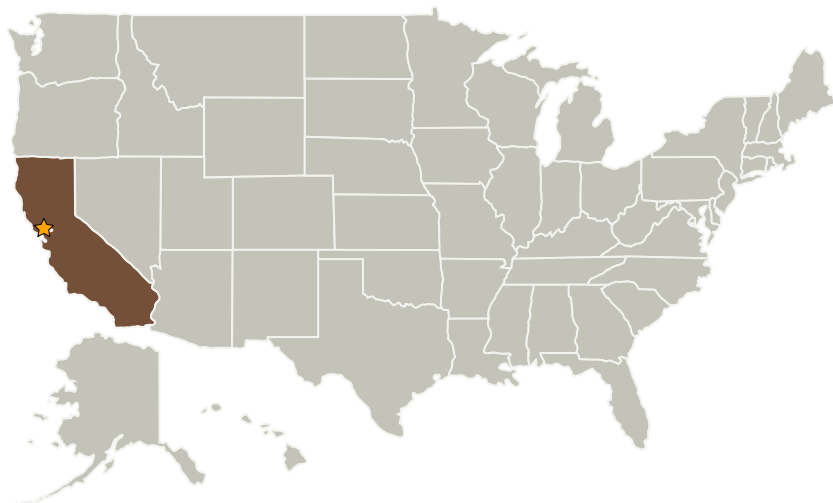
Project Introduction	1
Anticipated Benefits	1
Primary U.S. Work Locations and Key Partners	2
Stories	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	3
Technology Areas	3

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Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations

California

Stories

1676 Approval #17536
(<https://techport.nasa.gov/file/8733>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Center Innovation Fund: ARC CIF

Project Management

Program Director:

Michael R Lapointe

Program Manager:

Harry Partridge

Project Manager:

Elwood F Agasid

Principal Investigator:

Elwood F Agasid

Co-Investigators:

Abraham T Rademacher
Kimberly Ennico Smith

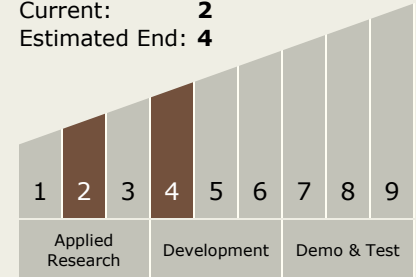
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Technology Maturity (TRL)

Start: 2
Current: 2
Estimated End: 4



Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.2 Observatories
 - └ TX08.2.3 Distributed Aperture